Lowering Treatment Intensities In Order To Increase Patient Access To Specialized Mental Health Care Services

A case study of five District Psychiatric Centers (DPCs)

Honghong Bei

Master Thesis

Institute of Health Management and Health Economics

Faculty of Medicine

UNIVERSITETET I OSLO

May 15. 2011

ABSTRACT

Background

One major challenge facing most specialized mental health care services is that demand for treatment exceeds supply, resulting in many individuals with psychiatric disorders remaining untreated even when effective treatments exist. The lack of treatment results in decreased health-related quality of life, increased long term sick leave, and the risk of suicide. In order to improve patient access, decisions have to be made on how to allocate the limited resources.

Aim

This study aims to investigate the consequences of changing the way current resources are distributed in order to increase patient access.

Methods

The means of lowering (average) treatment intensity (i.e. each patient receiving fewer consultations) was used to improve patient access by transferring consultations from those that received treatment in 2007 (insiders) to those that did not receive treatment (outsiders). Calculations on what reductions in average treatment intensities were needed to reach refusal rate levels at 10%.

Results

This method is applied for outpatient clinics of five District Psychiatric Centers (DPCs) supplying specialized mental health care services for adults. Given an average treatment intensity for outsiders being equal to 5 consultations, the average treatment intensity of insiders (those receiving more than 5 consultations) had to be reduced by from 1.86% to 6.55% in order to reach a DPC refusal rate level at 10%. Given an average treatment intensity for outsiders being set at 10 consultations, the same figures became from 3.71% to 13.1%.

ACKNOWLEDGEMENTS

First, I would like to thank my supervisor, Professor Sverre Grepperud at the Institute of Health Management and Health Economics, for his constructive comments and invaluable suggestions on my thesis. He helped me to pose my questions and arguments in a more thoughtful and presentable way than they might otherwise be expressed. Without his patient guidance, persistent help and encouragement, the completion of this thesis would not have been possible.

Second, I would like to thank the great help and positive attitude provided by Per Arne Holman at Lovisenberg District Psychiatric Center. He introduced me this research topic, helped me in data gathering, and gave me many invaluable comments and inspirations on an earlier version of this thesis, resulting in a significantly improved final version.

Thirdly, I would thank Alna Furuset DPC, Alna Sinsenveien DPC, Lovisenberg DPC, Vinderen DPC and Tøyen DPC for permission to use their data.

In addition, I would also thank my friend Nomussa Mbanga for reading through my thesis and making the language correction. Without you, this would have been a lot harder.

Finally, I am grateful to my family and friends for their encouragements. Especially, I am thankful to my husband Bård Einar Heggelund and my lovely daughter Frida, for their love and never ending support. You are the sunshine of my life!

Honghong Bei

May 2011, Oslo

DECLARATIONS

I have read and understood the paragraph above. I hereby declare that the thesis is written by me and:

- *It is a result of my own work*
- *It has not been used for another exam at another department, university, or University College in Norway or any other country.*
- *It does not refer to or quote works of others without stating it both in the text and in the reference list*
- *It does not refer to or quote previous writings of my own without stating it both in the text and in the reference list*
- *It mentions explicitly all sources of information in the reference list.*

Title of thesis:

Lowering Treatment Intensities in order to Increase Patient Access to Specialized Mental Health Care Services - *A case study of five District Psychiatric Centers (DPCs)*

Date and signature

Table of Contents

LIST OF TABLES

1. INTRODUCTION

One of the primary functions of mental health providers is to provide treatment to all who are in need of it. In Norway, approximately 15-20 percent of the adult population is estimated to suffer from some type of mental health problem, while 3 percent is estimated to have a serious mental disorder (The Ministry of Health and Care Services 2005). However, due to the high prevalence of mental health disorders combined with limited treatment capacity, the demand for treatment exceeds supply, meaning that many individuals with psychiatric disorders remain untreated even when effective treatments exist. The lack of treatment may have serious consequences such as a lower health-related quality of life, increased long term sick leave, and a higher probability for suicide (Mykletun, Knudsen & Mathiesen 2009).

Mental disorders are a growing public health concern as they are highly prevalent and cause considerable suffering, not only for those having such diseases, but also for their families and for society as a whole. The regional strategic plan for mental health care of the South-Eastern Regional Health Authority (Helse Sør-Øst RHF 2005) emphasized that the supply of specialized mental health services for adults should be strengthened from the current level of 3.5% to 5%. Furthermore, by 2015, the rate for Oslo should reach 5.5% of the adult population.

Like most countries in the world, Norway faces high demands on their health care systems combined with limited budgets. This makes it difficult to provide everyone in need of treatment with the quantity they demand. Excessive demand and scarce resources implies that decisions have to be made on how to allocate the limited health care resources.

This paper aims to investigate the consequences of changing the way current resources are distributed in order to increase patient access. To what extent, lower treatment intensities will increase access to specialized mental health care services by lowering refusal rates. This is done for outpatient clinics at five District Psychiatric Centers (DPCs) in Oslo. The research question is to identify what reductions in average treatment intensities are needed to reduce the current refusal rates to 10%. In 2007, the refusal rates for the DPCs in question, varied between 16% and 29%.

The structure of this thesis is as follows. In Chapter 2 some background information is provided. Here a presentation of some of the challenges facing the mental health care sector is given together with a description of the Norwegian health care system including a brief introduction of the delivery system and the opportunities for patients. Chapter 3 describes the five DPCs, being the research objects of this study, and presents data on refusal rates and treatment intensities. In Chapter 4 a simple theoretical model is presented to identify factors that may have effects on waiting times and refusal rates. In which the approach of lowering treatment intensity is identified as the way to improve patient access in this study. Chapter 5 presents the method applied to calculate the average reduction in the treatment intensities needed to reach refusal rates at 10% for the five DPCs. Chapter 6 presents the results of the estimation method and study limitations. Finally, Chapter 7 gives the summary and conclusion.

2. BACKGROUND

In this chapter I will give some background information. The chapter will progress as follows: section 2.1 presents some of the challenges facing the mental health care sector; section 2.2 gives a description of the Norwegian Health Care System and includes a brief introduction of the delivery system (DPCs), equity and access regulation and the admission process in DPCs.

2.1 Challenges facing the mental health care sector in Norway

"Mental disorders comprise a broad range of problems, with different symptoms. However, they are generally characterized by some combination of abnormal thoughts, emotions, behaviors and relationships with others" (WHO 2010).

Mental disorders or mental illnesses cover a wide range of conditions such as depression and other mood disorders, anxiety disorders and phobias, disorders due to drug or alcohol abuse, schizophrenia and other delusional disorders, personality and developmental disorders such as autism, mental retardation and dementia (OECD 2008).

High prevalence

According to the report "Mental disorders in Norway - A public health perspective" from The Norwegian Institute of Public Health (Mykletun, Knudsen & Mathiesen 2009), about half of the Norwegian population will be affected by one or more mental disorders at some point during their lifetime and approximately one of three Norwegian adults will experience some type of mental illness during a year. In addition, approximately 15-20 percent of the adult population is estimated to have some kind of mental health problems, while 3 percent is estimated to have a serious mental disorder (The Ministry of Health and Care Services 2005).

Mental health disorders are the most common of all possible diagnosis given by General practitioners (GPs) (Statistics Norway 2006). Anxiety disorders, depressive disorders and drug-related disorders, particularly comprehensive alcohol abuse and alcohol dependence, are the three most common types of mental sufferings in the population (Mykletun, Knudsen & Mathiesen 2009).

Treatment gap

There is a gap between the need for treatment and the services supplied. No reliable figures exist for the number of people who receive no treatment. According to The Office of the Auditor General's survey of the specialized mental health services for adults (Riksrevisjonen 2008), however, 70% of GPs responded that there was a low probability for their own referred patients to receive specialized mental health services. When the GPs were asked what types of mental disorders were most often denied specialized mental health services, 68% answered moderate cases of anxiety and /or depression. In addition, it is also emphasized that the prioritizing of patients differs across DPCs, and there are no actual priority setting at some DPCs.

For the most common forms of mental disorders, particularly anxiety disorders and depressive disorders, the supply of treatment is much less. According to the study of service utilization rates for selected psychiatric disorders in community-based survey, the difference between the number of people needing treatment and number of people receiving treatment (treatment gap) for major depression disorders was 30%, and for the generalized anxiety disorders it was 33% in Norway (Robert et al. 2004). This may imply that many individuals with psychiatric disorders remain untreated or receive primary care even when in need of specialized mental health services. High prevalence combined with limited resources can be one major reason.

Consequences

The lack of treatment may have some consequences such as a lower health-related quality of life, increased long term sick leave, and a higher probability of suicide (Mykletun, Knudsen & Mathiesen 2009). Some studies have suggested that mental disorders have more adverse effects on functioning and quality of life than is the case for serious chronic physical illnesses such as arthritis, diabetes, and hypertension (Kessler et al. 2001; Wells et al. 1989).

A recent report on sick leaves published by The Norwegian Labour and Welfare Administration statistics (NAV 2010) reported that 13.4% of the sick leaves in 2009 were due to mental disorders. Of the population aged between 16 and 67 years, 3.1% received disability pensions because of a psychiatric diagnosis, constituting one third of all people

on disability pension. The Norwegian suicide rate is fairly low in comparison with other Northern European countries. Nevertheless, suicide is one of the most important causes to death for people under 45 years of age being responsible for 13% of all deaths in this age group (The Ministry of Health and Care Services 2005).

Mental illnesses cause more lost man-working year than any other disease group. This is because disability pensions for mental disorders in average are granted 9 years earlier compared with somatic diseases. The effect of depression on increased mortality is in statistical terms comparable with the effects from smoking (Mykletun et al. 2009). Depression also increases the mortality rates for major disease groups such as cardiovascular diseases and infectious diseases, and possibly cancer (Mykletun et al. 2007). Alcohol abuse increases the risk of dying from accidents and suicide (Norstrom 2006; Skog 2001).

Costs and financing

Psychiatric ailments are now the most costly ailment in the Norwegian health care sector. In 2009, the central government budget expenses in association with mental health services care amounted to approximately NOK 18 billion. This is an increase of about 5% if compared with 2008 (Statistics Norway 2010).

However, most of the costs associated with mental health problems are not necessarily health care costs, but are costs outside of the health care sector such as reduced productivity at work, sick leaves, early retirement and a low life quality. In addition there are indirect costs being associated with the dependents of mentally ill persons. These costs far outweigh the direct health care costs (WHO 2005, p.128). The Norwegian disability benefits amounted to more than NOK 41 billion in 2004, of which 30% mattered for people with mental health disorders, representing 3.5% of the gross national budget (Mykletun & Knudsen 2009).

Like most countries in Europe, Norway is confronted with limited resources. Although Norway's health care spending is one of the highest in the world, total health care spending (about NOK 203 billions) accounted for 8.9% of GDP in Norway in 2007, while the spending on mental health services (about NOK 16 billions) constitute only 8%

of the total health care spending (Statistics Norway 2008 and 2009). This may suggest that the mental health sector should be given a higher future priority relatively to the somatic health sector.

2.2 The Norwegian health care system

The Norwegian health care system is predominantly tax based and is built on the principle of equal access to services, regardless of social status, location and income. To fulfill this aim, The Norwegian Health Care System incorporates a decentralized model of provision of welfare goods and services; the structure is organized on three organizational levels, the national, the regional and the local level.

The Ministry of Health and Care Services (HOD) represents the national level and has the overall responsibility for the health care sector. Generally, the role of the government is to present national health policies, to plan and manage legislations, and to allocate funds. The regional level is referred to as providing secondary health - and social care services and is represented by four Regional Health Authorities (RHAs): Northern Norway RHA, Central Norway RHA, Western Norway RHA, and Southern-Eastern Norway RHA. They have responsibility for specialized health care services including somatic and mental health institutions, as well as other specialized medical services, such as laboratory, radiology and ambulatory services, special care for persons with drug and alcohol addictions. The local level is represented by 431 municipalities all having responsibility for the provision and funding of primary health care (including nursing care) and social care services (Johnsen 2006, p.16-21).

The Norwegian national insurance scheme insures all Norwegian inhabitants where premiums follow from taxation. All insured persons have the right to free treatment and free medication in public hospitals. The patient has to pay a part of the treatment costs at GPs, at private contract specialists (*avtalespesialister*), for certain prescription drugs and for transportation costs in connection with examination or treatment. The municipality and/or the National Insurance cover the major part of the expenses (Furuholmen & Magnussen 2000, p.21; Johnsen 2006, p.34-38).

The mental health services are generally financed by block transfers from the state to the regional health authorities and by earmarked funding as part of the Escalation Plan for the Mental Health Sector. So far there is no activity-based funding in place for this area, although there are some fee-for-service arrangements established for mental health care services provided as ambulatory care. The block grant contribution is allocated from the region to the health enterprises based on the needs of their catchment areas. It is not possible to point out exactly how this allocation is conducted but it has been shown that the regional health authorities increase the block grants to health enterprises based on age structure (Johnsen 2006, p.53).

2.2.1 Specialized mental health care services provided by District Psychiatric Centers (DPCs)

Government guidelines emphasize that specialized mental health care services are to be integrated with, and run according to, the same principles as other specialized health care services (Norwegian Directorate of Health 2006). The specialized mental health services consist of three main categories: mental hospitals are responsible for acute-care; District Psychiatric Centers (DPCs) provide less-acute specialized services on a more decentralized level; while some private practicing psychiatrists and psychologists receive financial support from the government to keep out-of-pocket payments at an acceptable level for the patients/service-users (Johnsen 2006, p.116; The Ministry of Health and Care Services 2005).

DPCs are examples on community-based mental health services. Evidence shows that such community based mental health services are both clinically effective (Leff et al. 1994; Marks et al. 1994) and cost-effective (Knapp et al. 1997 and 1998). They provide an ethical basis for care that respects the rights of people with mental disorders. They also allow for the delivery of care near places where people live and work and therefore improve the accessibility of services. Furthermore, people who receive such services indicate their preference for community based care over hospital-based care (WHO 2005, p.99).

In Norway, DPCs, as part of the specialized mental health care services, are a key component in the National Mental Health Action Plan (1998-2008) (Ruud et al. 2004). The Norwegian Mental Health Action Plan was adopted by the Norwegian Parliament in 1998. The programme was extended to the period 1999-2008 and represents a number of strategies and measures targeting national, regional and local level objectives. The overall goal is to create adequate, coherent and well functioning services at all levels for people that suffer from mental illness. A major element of the plan was to establish DPC's throughout the country for improving access to mental health care services.

To ensure a focus on local needs and on close collaboration with municipal staff, DPC's act as professionally independent units responsible for providing mental health services to adults in specific geographical areas (catchment areas). It is recommended that each DPC should cover about 30.000 - 50.000 adult inhabitants. The main objective of a DPC is to collaborate with the hospitals on the one hand, and with the primary health care services and municipalities on the other, thus creating a coherent and well-functioning line of services for the service user (Norwegian Directorate of Health 2006).

A DPC consists of a number of units that provide a variety of services (Norwegian Directorate of Health 2006; Statens helsetilsyn 2001 and 2009):

- Outpatient clinic and services: The outpatient clinic is viewed as the most essential part of the DPC. It usually provides consultations, supervision and professional support to GPs, municipal services and agencies.

- Day treatment clinic (daytime training/daytime care): This part of the DPC offers more extensive activities for patients, than do outpatient clinics, often consisting of social events and excursions for the service users/patients.

- Crisis resolution and home treatment teams (assertive outreach): These teams visit patients outside the clinic, often in patient's home environments in order to make assessments regarding the level of care required.

- Inpatient units/services: The DPC has an inpatient unit for patients in need of short-term treatment. Some DPCs also have beds for patients needing a long-term treatment.

The organization of DPCs is still being developed. However, most agree that the DPCs, in the long term, should develop optimal functions adapted to local needs and conditions. Thus, it is to be expected that DPCs will differ somewhat from each other, according to local conditions. Since 1998 there has been a considerable expansion of these institutions and by now there are 71 DPCs, covering 86% of the adult population. Twelve more centers, that will cover the remaining adult population, will be established the coming years (Norwegian Ministry of Health and Care Services 2005).

2.2.2 Equity and access regulation

The Norwegian Health Care System is based on the principle that health care services are supposed to be distributed according to needs regardless of diagnosis, geography, socioeconomic status, gender and age (Johnsen 2006, p.1). The principle can be formulated in two versions: *horizontal equity* (persons in equal need should be treated the same) and *vertical equity* (persons with greater need should be treated more favorably than those with less need) (Hauck, Smith & Goddard 2004, p.26).

However, despite the fact that Norway is among those countries that spend most resources on health care, there is a gap between the general public's demand for health services and the resources that are needed to produce the same services (National Health Plan for Norway (2007-2010) 2007, p.64). This makes it difficult to provide everyone in need of treatment with the quantity they demand. Excessive demand and scarce resources imply that decisions have to be made on who to give priority. Priority-setting will now ensure that health care resources are utilized in the best possible manner for the population as a whole (National Health Plan for Norway (2007-2010) 2007, p.65).

Health legislation has become a more important mean in ensuring equal access and adequate prioritization. The patients have been given robust and extensive rights through the Patients Rights Act which include a right to medical assessments and a right to necessary health care. According to The Patients Rights Art (Lovdata 2004), the patient has a right to specialized health services if the patient has an expected health gain from the intervention and given that the costs are in a reasonable relationship to the effects of the intervention.

When patients are referred by GPs to specialized health care services, they are granted the right to be evaluated (assessment) by a specialist within 30 days. However, whether or not a patient will have a right to "necessary help" will be determined by a professional evaluation. The right to health care is defined according to three criteria of priority setting (dimensions): 1) the seriousness of the patient's health condition, 2) the expected improvement in health from the treatment (expected utility), 3) the cost of treatment relative to the expected improvement (cost-effectiveness) (Norwegian Directorate of Health 2008, p.14).

For specialist mental health services, the Norwegian Directorate of Health (2008) has established priority guidelines that are valid for adults, children and adolescents. These guidelines are to support health care providers in evaluating patients and prioritizing between them. The guidelines are to ensure that those most in need for services, as defined by the three criteria of priority-setting, will have the shortest waiting time.

2.2.3 The admission process in DPCs (non-emergency procedure)

To receive treatment at a DPC outpatient-clinic, patients first have to consult a GP to obtain a referral. This procedure is the same for both somatic and psychiatric clients. The GPs are a central part of the primary health care system, and the patients themselves must initiate contact with them. The responsibilities of GPs include making a diagnosis at an early stage of a disease, treating everyday problems and referring patients to specialized medical care services and/or to hospital care if necessary. The GPs are an important link between the primary health care sector and the specialized health care sector, and act in many ways as gatekeepers. The GP's knowledge and understanding of a patient makes it easier to decide when it is time to refer the patient to specialized health care services (Furuholmen & Magnussen 2000, p.33-35; Johnsen 2006, p.19).

After reception of referrals from GPs, a DPC must set up an internal joint meeting or "intake meeting" where a team of psychiatrists and psychologists participate. This "intake meeting" is to evaluate and assess the submitted referrals and, on the basis of the priority setting criteria *(see section 2.2.2),* decide which priority group the patient belongs. The three priority groups are: (1) Priority patients who satisfy the requirements

of being in need of specialist health care services supplied by the DPCs. (2) Patients who satisfy the requirements for being in need of specialist health services but should be treated at other institutions than DPCs. (3) Patients who are refused treatment (NO). Those who are found not to have a right to specialist health services are referred back to primary care sector (Riksrevisjonen 2008, p.39).

When the right to necessary treatment is granted by an "intake meeting", a treatment is to be started within a specified time limit, normally within 30 days. In addition, every patient with a right to necessary treatment should be provided an individual plan. The plan is to identify needs, set goals, and specify what kinds of health services are needed. The plan should also describe what type of cooperation with other health - and social service organizations are needed. A feedback from the DPC to the GP, for every submitted referral, should be given within 30 working days. When the feedback letter is sent, the patients will be registered on a waiting list by a patient administration system (Statens helsetilsyn 2009, p.14).

In this study, rejected admissions (refusals) refers to the referrals that are not granted the right to necessary treatment in a DPC meaning that they are returned to the primary health care sector or to other specialist mental health care institutions.

3. A DESCRIPTION OF THE STUDY UNITS: FIVE DPCs

In section 3.1, an overview of the five DPCs will be given. Section 3.2 presents the current status as concerns refusal rates, mean waiting times, referral rates, and average treatment intensities for the five DPCs. This is done in order to identify possible relationships among these variables.

3.1 Introduction

In this study, the study units are the five following District Psychiatric Centers (DPCs), all providing specialized mental health care services in Oslo: Alna Furuset DPC, Alna Sinsenveien DPC, Lovisenberg DPC, Vinderen DPC and Tøyen DPC. According to data obtained from The City of Oslo (Oslo kommune 2008), these five DPCs are in total responsible for about 300.000 inhabitants, of which 219.000 are adults (between 18 and 67 years old). The five catchment areas cover more than 50% of the total number of adults in the city of Oslo. There is reason to believe that the population in each area differs with respect to mental health status and needs for mental health care. Table 1 provides information on catchment area sizes.

Table 1. Catchment area size and population size for five DPCs in Oslo (2007).

DPC	Covered District areas in Oslo	Locations in Oslo	Number of inhabitants in 2007	Number of adults (18-67 years) in 2007
Alna-Furuset	Alna	East	44820	30087
Alna-Sinsenveien	Bjerke	East	25530	17035
Lovisenberg	St. Hanshaugen	Central	29082	25431
Vinderen	Frogner, Ullern, Vestre aker	West	116401	82236
Tøyen	Gamle Oslo, Grunerløkka	Inner East	78123	64216

Source: Oslo kommune 2008, *Folkemengden i Oslo etter bydel og 1-årige aldersgrupper: I alt, kvinner og menn 2004-2010*, Oslostatistikken.

Table 1 lists the various district areas in Oslo that each DPC is responsible for. The catchment areas differ in size both measured by population size and the number of adults, with Vinderen as the largest one (82.236 adults) and Alna-Sinsenveien as the smallest one (17.035 adults).

In Oslo, average age, average net income and educational level vary across regions. Health and life quality are observed to be higher for those who live in the western side of the city relatively to those living in the eastern side. Females living in Gamle Oslo (inner east) have a life- expectancy of 77.4 years, almost 6 years shorter than females living in Ullern (west). Males at Sagene (inner east) have a life- expectancy of 68.4 years, 12 years shorter than males living at Vindern (west) (Dybendal & Skiri 2005). The same pattern is confirmed by studies on the prevalence of psychiatric illnesses. In the eastern part of the inner city, 20% of males aged between 40 and 45 years have had symptoms of psychiatric problems, compared to only 5% in the Western and central parts. For female, the same frequencies are 30% and 10% (Rognerud, Strand & Dalgard 2002).

The above evidence illustrates that social inequality in morbidity and mortality is associated with levels of income, wealth and education. There is significant variation of population mental health care need across DPCs' catchment areas.

In the following section, refusal rates and treatment intensity status for the five DPCs will be reported. The data collection was conducted by the author (and others) while participating in a project at Lovisenberg DPC named "A capacity analysis of referral rates, rejection, waiting times and treatment intensity at district psychiatric centers in the Southern- Eastern Norway Regional Health Authority". Due to some potentially sensitive information, all participating DPCs are anonymized by using alphabet letters A, B, C, D, and E instead of the name of the DPCs.

3.2 Refusal rates and average treatment intensities

In this section, I will first describe the data collection and then define some important concepts. Finally I will present figures on refusal rates, mean waiting times, referral rates and mean treatment intensities for the five DPCs.

3.2.1 Data collection

In this study, the primary data source was the administrative management system databases of the five DPCs in Oslo *(see table 1)*. All five DPCs use DIPS computer system to register patient information and to manage the daily work. DIPS is "Paperless Electronic Patient Record System" implemented in 55% of the health enterprises in Norway. The DIPS systems cover a wide range of products such as electronic patient records, nursing documentation and treatment planning, medication and prescription, workflow and process management. The data used in this study are mainly obtained from two main databases (DIPS – 6813 and DIPS-7996-MBDS) both being part of DIPS.

Data on mean waiting times and refusal rates are taken from the DPC's annual report named "DIPS – 6813 overview information of referrals received in the period 2007". The above report contains patient specific information on medication history, diagnosis and priority group, intake planning, the number of assessment days, the number of waiting days and number of days to the deadline expires.

Data on treatment intensities and number of outpatient consultations were collected from the annual statistical report named "DIPS-7996-MBDS (The Minimum Basic Data Set for Psychiatry) 2007". Here we find information about each patient's personal and medical background, information about diagnosis, evaluation conclusions, treatment planning, and the number of consultations. MBDS contains standard patient data that psychiatric institutions submit to the Norwegian Patient Register (NPR).

3.2.2 Concepts

A: Number of submitted referrals in 2007 (denoted as R_{2007})

The number of submitted referrals in 2007 is total number of referrals (for adults) submitted by GPs or to other specialist mental health care institutions to DPC outpatient clinics in 2007. In this study, R_{2007} can be expressed by following mathematical definition:

$$R_{2007} = r_{2007} + a_{2007} \qquad (1)$$

r_{2007} is the number of rejected referrals during 2007 being all referrals that are not given a right to "necessary care" at a DPC. This implies that the patients are returned back to the GPs or to other specialist mental health care institutions. a_{2007} is the number of admitted referrals in 2007 being all referrals that are given a right to "necessary care" at a DPC and for this reason becomes registered on a waiting list. Our data set consists of 4110 referrals from the five DPCs in total. Of these, about 3164 referrals were accepted and registered on waiting lists (admitted referrals), while the remaining ones were rejected.

B: The Referral rate (denoted as β_{2007})

The referral rate in 2007 is defined as the number of submitted referrals in 2007 *(R_{2007})* divided by catchment size being the number of adults (18-67 years) in 2007 *(P_{adults})* . Thus, β_{2007} can be expressed by the following ratio:

$$\beta_{2007} = \frac{R_{2007}}{P_{adult}} \qquad (2)$$

Obviously, (2) shows that if the number of adults *(P_{adults})* is held constant, then the referral rate will increase if the number of submitted referrals increases.

C: The Refusal rate in 2007 (denoted as γ_{2007})

If we divide (1) with R_{2007} on both sides, we get

$$1 = \frac{r_{2007}}{R_{2007}} + \frac{a_{2007}}{R_{2007}} = \gamma_{2007} + f_{2007} \qquad (3)$$

We observe that the refusal rate in 2007 *(γ_{2007})* is the number of rejected referrals during 2007 *(r_{2007})* divided by the number of submitted referrals in 2007 *(R_{2007})*; $\gamma_{2007} = \frac{r_{2007}}{R_{2007}}$. *S*imilarly, the admission rate in 2007 *(f_{2007})* is the number of admitted referrals in 2007 *(a_{2007})* divided by the number of submitted referrals in 2007 *(R_{2007})*; $f_{2007} = \frac{a_{2007}}{R_{2007}}$. According to (3), the refusal rate in 2007 can be written as follows:

$$\gamma_{2007} = 1 - f_{2007} \qquad (4)$$

We observe from (4) that the refusal rate equals 1 subtracted the admission rate. Now, if the admission rate becomes higher, the refusal rate must be lower.

D: The number of treated patients in 2007 (insiders) (denoted as N_{2007})

In this study, the number of treated patients in 2007 are adult patients (18 years or older) treated at outpatient policlinics at a DPC in 2007. This group may also include patients that started their treatment before 2007 as long as they received treatment during 2007. All treated patients in 2007 can be called "insiders". Patients who received emergency treatment were excluded. Our data set consists of 6167 treated patients (insiders). A total of 64.718 consultations were provided by the five DPCs in 2007.

E: The treatment intensity in 2007 (denoted as t_i^{2007}) and the number of total consultations in 2007 (denoted as T_{2007})

We define the treatment intensity in 2007 as the number of consultations each insider receives, t_i^{2007}, where i refers to insider i. In this context, consultations include only face-to-face consultations at outpatient clinic services and daytime care treatment, while telephone consultations are excluded.

The number of total consultations *(T_{2007})* can be interpreted as the maximum treatment capacity of the relevant DPC, and is the sum of the consultations all insiders receive during 2007 *(t_i^{2007})*. It can be expressed as follows:

$$T_{2007} = \sum_{i=1}^{N} t_i^{2007} \qquad (5)$$

F: Mean treatment intensity for all treated patients (insiders) in 2007 (denoted as $\bar{t}_T^{2007}$)

The mean treatment intensity for all treated patients (insiders) in 2007 at a DPC *($\bar{t}_{2007}^{T}$)* is calculated by dividing the total number of consultations *(T_{2007})* by the number of treated patients (insiders) *(N_{2007})*. Using (5) can now be expressed as follows:

$$\bar{t}_{2007}^{T} = \frac{T_{2007}}{N_{2007}} = \frac{\sum_{i=1}^{N} t_i^{2007}}{N_{2007}} \qquad (6)$$

From (6), given that the number of treated patients (insiders) is held constant, the mean treatment intensity will increase if the number of consultations increases. When the number of total consultations is held constant, the number of treated patients will be lower if the mean treatment intensity increases. On the other hand, if the treatment intensity becomes lower (patients are given less consultations in average), more patients can be treated. Thus, we observe that a higher mean treatment intensity will reduce the number of patients that can be treated at the DPC given a fixed capacity.

G: Mean waiting times (denoted as WT)

All DPCs manage an appointment system for outpatient clinic where every patient receives a designated date for his /her first consultation. In addition, all admitted referrals

(a) receive a scheduled waiting time during the "intake meeting". Waiting times for specialized mental health care services at the DPC outpatient clinics are here defined as the difference (days) between the date a referral accepted by a DPC and the date the first consultation starts (date of the first face-to-face contact). The mean wait times *(WT)* are now calculated by dividing the total number of waiting days for all admitted referrals by the total number of the admitted referrals, in the same period *(Mean Waiting Times = Total number of waited days / The number of admitted referrals)*. Note that some referrals may have very long waiting times that will produce a skewed distribution of waiting time.

3.2.3 Refusal rates and average treatment intensities

In table 2 below, we present numbers for referral rates, mean waiting times, refusal rates and mean treatment intensities for the five DPCs. We are in particular interested in identifying any relationships between the above variables.

Table 2. Descriptive statistics: Referral rates, waiting times, refusal rates and mean treatment intencities for five DPCs (2007).

DPC	Referral rate (untreated) (β_{2007})	Mean waiting times (days) (WT)	Refusal rate (γ_{2007})	Mean treatment intensity (consultations) ($\bar{t}_T^{2007}$)
A	2,4%	27	16%	10,9
B	2,2%	72	29%	12,1
C	1,4%	66	22%	8,9
D	3,6%	36	19%	10,3
E	1,0%	71	16%	10,8

Table 2 shows there are significant variations in referral rates, mean waiting times, refusal rates and mean treatment intensities across the five DPCs. The figures of referral rates show that the proportion of patients referred to DPCs by GPs in 2007 vary between 1% and 3.6%. Mean waiting times differ from the highest one being 72 days (over 10 weeks) to the lowest being 27 days (about 4 weeks), meaning that there is a 45 day

difference between the two. The refusal rates vary between 16% and 29%, meaning that there is difference equal to 13 percentage points. The mean treatment intensities are in the range of 8.9 to 12.1 consultations.

Now, a natural question becomes, why are the DPCs so different when it comes to refusal rates, mean waiting times, referral rates and mean treatment intensities? What do we expect and why? An explain can be found by studying equation (10) *(see back in Charpter 4)*.

It is expected that the DPCs with longer mean waiting times also would have lower refusal rates when the capacity of supply is fixed. Since lower refusal rate means that more referrals will be admitted, this makes a growth in demand for more capacity use. But, if capacity is fixed (supply is unchanged), then the more admitted referrals (the less refusal rate), the longer people are waiting, results in longer mean waiting times. Table 2 shows that only DPC-E with the second longest mean waiting times (71 days) has the lowest refusal rate (16%). However, mean waiting times for DPC- B, C, D and A are 72, 66, 36 and 27 days in turn, but their refusal rates are respectively 29%, 22%, 19% and 16%. It seems that the DPCs with longer mean waiting times also have higher refusal rates rather than the results we expected.

In addition, we expect that the DPCs with lower referral rates also would have lower refusal rates when the capacity of supply is fixed, since the lower referral rate, the lower demand for mental health care services. Table 2 shows that DPC-E, with the lowest referral rate (1%), also has the lowest refusal rate (16%). Nevertheless, DPC- C and B have lower referral rates (1.4% and 2.2%) than DPC- A and D (2.4% and 3.6%), but DPC- C and B have higher refusal rates (22% and 29%) than DPC- A and D (16% and 19%). These indicate that there is no clear tendency like we expected that the DPCs with lower referral rates have lower refusal rates.

Moreover, we expect that lower mean treatment intensity would be related to lower refusal rate and shorter mean waiting times. A lower treatment intensity (patients are given less consultations in average) means that more patients can be treated at the DPC with a fixed capacity *(see (6))*. This makes a growth in supply of health care services, thus decreased refusal rate and reduced waiting times. Table 2 shows that DPC-B has the

highest mean treatment intensity (12.1 consultations) with the highest refusal rate (29%) and the longest mean waiting times (72 days). Nevertheless, DPC- A and E have the almost same value of refusal rates (16%) and mean treatment intensities (about 11 consultations), but differ in the waiting times (21 days in DPC-A and 72 days in DPC-E). Furthermore, DPC- C and D have lower mean treatment intensities (8.9 and 10.3 consultations) than DPC-A (10.9), but they have higher refusal rates (22% and 19%) and mean waiting times (66 and 36 days) than DPC-A (the same figures are 16% and 27 mean waiting days). These indicate that it is not as we expected that the DPCs with lower mean treatment intensities have lower refusal rates and shorter mean waiting times.

To sum up, by comparing the five DPCs, significant variations are observed for referral rates, mean waiting times, refusal rates and mean treatment intensities. It is not as we expected, for example that the DPCs with longer mean waiting times also would have lower refusal rates. Rather, it seems that the DPCs with longer mean waiting times also have higher refusal rates. Furthermore, we expected that the DPCs with lower referral rates also would have lower refusal rates, but this was not the case. Finally, there is no clear tendency that those with lower mean treatment intensities also have lower refusal rates and shorter mean waiting times. This means that there are other factors that have an impact on a patient's access to the DPC services for example resource availability (budget size) and cost-efficiency.

4. WHAT FACTORS DETERMINE THE NUMBER OF PEOPLE WAITING FOR TREATMENT? - A MODEL OF DEMAND AND SUPPLY

In this chapter I present a simple theoretical model of demand and supply in order to identify factors that may have an effect on waiting times and the number of people waiting for treatment. A patient waiting can simply be defined as a queue of patients waiting for access to a health care service (Vissers et al. 2001). In this study, waiting list includes two groups of patients: one group patients whose referrals are rejected and one group patients who are admitted by a DPC but are waiting for their first treatment. There is no single reason for why waiting lists exist in the health care sector. It is a multifaceted problem being the result of a complicated interplay between demand and supply. Possible reasons for waiting lists and long waits are that the need for care has increased due to higher prevalence, higher incidence or growing expectations. In addition, new technologies leading to widening indications may also increase the waiting list length. An additional explanation is cost-inefficiency for example low productivity, bad management and logistic problems act (Council of Europe 2000).

It is argued that, in principle, waiting lists can be reduced by implementing supply-side policies or demand-side policies. Possible supply-side policies are more resources (increase the number of specialists) and a higher productivity for example by linking payments to the performance of doctors and hospitals (activity-based remuneration). Demand-side policies include the implementation of priority rules and an effective management of waiting lists.

In the following a simple waiting model of effective demand and supply is presented where the time dimension is ignored. Rather, we focus on a given time period where a given number of individuals demanding treatments *(D)*, however, only a fraction of them are admitted *(effective demand; ED)*. Furthermore, the suppliers of a given service are able to provide this service to a given number of peoples *(S)*. To make the model as simple as possible we assume homogeneous individuals meaning that all demanders have the same need for a service. The number of individuals waiting for a service, *WT*, now becomes:

$$WT = ED - S \qquad (7)$$

Demand side:

In the following we will derive an expression for the number of individuals that are demanding treatment *(ED)*. First, we know that the number of demanders *(D)* is found by multiplying the catchment area size with the referral rate *(see equation (2))* e.g. the number of individuals that submit a referral to a DPC. Now by multiplying this expression with the admission rate *(see equation (3))*, we end up with the following expression for effective demand *(ED)*:

$$ED = (1-\gamma) \times \beta_{2007} \times P_{adult} \qquad (8)$$

From (8) we observe that the effective demand, in a given period, is a function of the admission rate, the referral rate and catchment area size.

Supply side:

Now, we will derive an expression for the total supply of services during a time period *(S)*. The health producer has a given budget $(\bar{B})$. The mean treatment intensity for each patient is equal to $\bar{t}$ and the cost of producing one consultation is *c*. This means that the total number of patients being given treatment can be derived by dividing the given budget, $\bar{B}$, with the total costs for a single treatment $(\bar{t} \times c)$. By doing this we end up with the following expression for the supply:

$$S = \frac{\bar{B}}{\bar{t} \times c} \qquad (9)$$

It follows from (9) that supply (the number of can be treated patients) in a specified period of time, equals the resource availability (budget) $(\bar{B})$ divided with the product of average treatment intensity $(\bar{t})$ and the unit cost of consultations *(c)*.

Now, by inserting (8) and (9) into (7) we arrive at the following expression for the number of effective demanders waiting for treatment:

$$WT = (1-\gamma) \times \beta_{2007} \times P_{adult} - \frac{\overline{B}}{\bar{t} \times c} \qquad (10)$$

The above expression can now be utilized to analyze factors that have an impact on the number of people waiting for treatment *(WT)*. We observe from (10) that there 6 variables that play a role where 3 of them can be classified as demand-side factors (the admission rate, the referral rate and catchment area size) and 3 of them as supply-side factors (budget size, treatment intensity (average), and cost per consultation (treatment unit)). In the following, we will discuss each of the six factors at a time.

4.1 Demand side factors

Admission rate *(1-γ)*

A higher admission rate, given that all other factors remain constant, means that the effective demand *(ED)* is increasing meaning that *WT* becomes higher. A lower admission rate (i.e. increasing refusal rate) leads to a reduction in the number of admitted patients, therefore, the effective demand for services goes down and *WT* will be lower (reduced number of persons will be waiting for treatment). Thus, fewer persons will wait for treatment the lower the admission rate is (or the higher the refusal rate is).

Admission rate can be affected by many factors, such as clinical factors (workload and sources availability, medical skill and physicians' personal and emotional factors, preferences of priority-setting related to the patient's conditions, quality of management), patient's condition factors (type of and seriousness of diagnosis, symptom severity, functionality). In addition, characteristics of the primary clinician may also have some effects.

Referral rate *(β_{2007})*

We observe from (10) that given that all other factors remain constant, a higher referral rate will increase *ED*, and, thus, the number of individuals waiting for treatment will increase *(WT)*. Many factors can influence the referral rate, such as GP-specific factors (personality, knowledge, interests; the relationship with patients and colleagues; tolerance

to uncertainty), patient-specific factors (expectations; needs and values; pressure for referral; preferences), and case-specific factors (type of condition; perceived seriousness).

Total adult population (18 – 67 years old) in the district area *(P_{adults})*

We observe from (10) that, given that all other factors remain constant, a higher number of adults in the catchment area will increase *ED*, and, thus, the number of individuals waiting for treatment will increase *(WT)*. A higher number of adults in the catchment area leads to a growth in the number of referrals, therefore, the effective demand for services goes up and *WT* will increase.

The only factors that can alter adult population size in the district area are deaths, immigration, and emigration. Immigration adds individuals to a population whereas deaths and emigration remove individuals from a population. When more individuals are being added to a population than are being removed, the population increases in size. Alternatively, when more individuals are removed from the population than are added to the population the population decreases in size. Population sizes do not change when the rate that individuals are lost from a population is equal to the rate that individuals are added to the population (dynamic equilibrium).

4.2 Supply side factors

Budget size *($\bar{B}$)*

When the other factors in equation (10) are kept constant, a higher budget (capacity) means that more people can be treated, thus *S* increases and *WT* will go down (fewer people waiting for treatment).

In Norway, DPCs are financed by global budgets (i.e. block grant) each year from their regional health authorities. Global budgets are budgets or expenditure targets for health care spending. Under a global budget, an individual DPC is paid a fixed amount for a given period of time for providing specified services in its catchment area. The size of the global budget (block grant) for each DPC may be set according to a set of criteria such as county tax revenues, the age composition of the population and population density; or it

can be set on a per capita basis while adjusting for age, sex, health status, and other determinants of health care spending. Budget size can also be based on providers' historical spending (usually based on the preceding year's spending, reduced by a predetermined percentage for savings). In addition, the budget can increase when the DPC is confronted with a soft budget constraint instead of hard budget constraint. A soft budget constraint means that if there is an overrun the purchaser will take part of the financial responsibility; a hard budget constraint means that the budget is fixed, and if there is an overrun the purchaser does not assume any responsibility, meaning that all the financial risk is shifted to providers. These above factors may have some impacts on the size of budget for the DPC providing mental health care services.

The unit cost per consultation *(c)*

A higher unit cost per consultation *(c)* means that fewer people can be treated for the same budget and the same treatment intensity, thus *S* decreases and *WT* will go up (a higher number of people waiting for treatment).

The unit cost per consultation *(c)* is an average cost for an out-patient consultation, and is defined as total costs in a DPC's outpatient division divided by total number of outpatient-consultations provided by the DPC in one year period. If total number of consultations is kept constant, while total costs goes up, then the unit cost per consultation *(c)* will increase. The major determinants of total costs for out-patient care of a DPC in a year include employee salaries and benefits, rent or depreciation of capital costs (equipment, buildings and land), building maintenance and utilities, general administration, consumables, medical records, cleaning, power, heat, and so on. Therefore, any changes in these factors will affect total costs, and thus unit cost per consultation.

Mean treatment intensity *($\bar{t}$)*

A higher treatment intensity (mean *t*) means that fewer people can be treated, for the same budget and similar treatment unit costs, thus *S* decreases and *WT* will go up (a higher number of people waiting for treatment). On the other hand, a lower treatment intensity means that the same resources will be shared among more people in need of

treatment. Therefore, by lowering the treatment intensity, more people can be treated, leading to less people waiting for treatment.

We defined the treatment intensity *(t)* as the number of consultations each patient receives. The size of "*t"* might influenced by circumstances related to the provider of care. Examples might include geographic location, the individual practice style of a clinician, organization structure and leadership, resources availability, medical skill and physicians' experiences of diseases, collaboration among health care providers and communication status with patient' s family. Alternatively, the size of treatment intensity *(t)* spent in DPC may depend primarily on issues related to patients' needs for instance, the type and severity of patients' illnesses, measures of patient personal and socioeconomic status, direct or indirect costs to the patient or their family.

4.3 Factors that are not taken into account in the above model (some weaknesses with the model)

There is one additional phenomenon that should be considered. A shorter waiting time (waiting list) increased the number of referrals leading to more demand for services. This is because, in Norway, patients have the right to "free hospital choice". This is described in The Patients' Rights Act. The law decrees that a patient has the right to choose the hospital or district psychiatric centre in which he/she wants to be treated. The free choice of hospital services is web-based, giving information about waiting times for a number of treatments across most hospitals in the country (Norwegian Directorate of Health 2010).

Given that patients are giving weight to waiting time costs, the DPC with shorter waiting times will attract patients from other catchments areas. Patients have incentives to choose a different hospital than their nearest if this can reduce waiting time. For many patients, information on waiting times is most likely found cooperation with his / her GP. In any case, it is the GP that makes the referral to the chosen hospital (Kjerstad & Kristiansen 2005). GP would probably like to choose the DPC with shorter waiting times, result in increasing referrals to the DPC. This can lead to an increase in the waiting time on a longer term.

4.4 Concluding remarks

Above, I have shown three ways of how to improve access to mental health care services from the supply side. The three are: 1) Provide more resource to increase provision of services (i.e. increasing $\bar{B}$). 2) Improve cost efficiency (i.e. decreasing c). 3) Reduce the treatment intensity (i.e. lowering t). An example of the first policy measure is the programme denoted "Faster back", this is a earmarked grant supplied by the state to purchase health care and rehabilitation services for employees on sick leave (and those who are at risk of becoming sick leave) to help them faster back to work (NAV 2010). By introducing this measure, the annual capacity has increased and thus treatments.

In the next chapter I will focus on lowering the treatment intensity (i.e. transferring consultations from those that received treatment in 2007 (insiders) to those that did not receive treatment (outsiders)) to improve patient access, and calculating how much reduction in average treatment intensities are needed to reach a 10% refusal rate target level.

However, when reading the analysis in the next chapter we should remember that changing treatment allocation between insiders and outsiders may have an impact on the quality of services. Less treatment for insiders may reduce the health outcome, but providing treatment for outsiders will increase the health outcome. The total effect on health may go either way, it could be that the decline in health for insiders will exceed the increase in health for outsiders; or it could be opposite. This can only be assessed by doing an analysis.

From economic theory, we know that the marginal utility on health declines with an increasing health care service. If so, there is reason to believe that a reduction in the treatment intensities for insiders and some treatments to outsiders will induce an overall positive effect on health.

5. CALCULATION METHOD

In this chapter I will present the calculations for the reductions in treatment intensities needed to reach our objective with respect to refusal rates for each of the five DPCs. The objective is to arrive at refusal rates for all DPCs being equal to 10%, meaning that $\gamma_{object} = 10\%$.

A reduction in current refusal rates will improve access to specialized mental health care services since more people now can be treated and thus waiting times will be reduced. However, such benefits come at the expense of those already receiving treatment, since lower treatment intensities may imply lower health benefits from a treatment program.

The reason for choosing a 10% refusal rate target level is somewhat arbitrarily. In 2007, the five DPCs studied here had refusal rates that varied between 16% and 29% *(see Table 2),* and I wanted to introduce a target level that was less than the lowest refusal rate observed for the five DPCs in 2007 (16%) but on the same time, not a too ambitious target level.

Based on available data from five DPCs, I will below show how I calculated the reductions in treatment intensities needed to reach the 10% refusal rate target level. To improve access for a given budget, it becomes necessary to transfer consultations from those that received treatment in 2007 (insiders) to those that did not receive treatment (outsiders). However, in this study, insiders that received five or less consultations will be shielded, in the sense that their number of consultations will be unchanged. This means I will only take away consultations from those insiders that received more than five consultations during 2007.

The purpose of this calculation is to derive how much reduction in the average treatment intensity (for insiders that received more than 5 consultations in 2007), is needed to reach refusal rate target levels at 10%, when the outsiders are given a certain average treatment intensity (5 and 10 consultations).

The first step in our calculation is to determine how many consultations in total must be allocated to the outsiders when the target refusal rate is 10% and each outsider is to be given a certain treatment intensity *(t^{new})*. This variable is defined as follows:

$$t^{new} = \bar{t} \times \Delta a \qquad (11)$$

Where $\bar{t}$ is the (average) treatment intensity that is given to outsiders and Δa is the number of admitted outsiders that follow from fulfilling the refusal rate target level (10%).

The second step in our calculation is to derive an expression for the number of consultations that are taken from the insiders (everyone that received treatment in 2007 and had a treatment intensity higher than 5 consultations), t^{old}. This variable is defined as follows:

$$t^{old} = X \times \bar{t}^{m}_{2007} \times m_{2007} \qquad (12)$$

Where $\bar{t}^{m}_{2007}$ is the (average) treatment intensity in 2007 for insiders that received more than 5 consultations, m_{2007} is the number of insiders that received more than 5 consultations in 2007 and *X* is the percent of consultations that is taken away from all insiders that received more than 5 consultations in 2007.

The third step in our calculation is to set $t^{new} = t^{old}$, when using the expressions in (11) and (12), which make the number of consultations allocated to outsiders equal to the number of consultations that is taken away from the insiders. This procedure gives the following expression:

$$\bar{t} \times \Delta a = X \times \bar{t}^{m}_{2007} \times m_{2007} \qquad (13)$$

The variable we are interested in *X* (the endogenous variable) while the other variables are given by data or by assumptions. Now, I will solve *X* in (14), which yields the following expression:

$$X = \frac{\bar{t} \times \Delta a}{\bar{t}^{m}_{2007} \times m_{2007}} \qquad (14)$$

In order to calculate *X*, we first need to calculate Δa and to assume values for $\bar{t}$. Thereafter, we need to find the size of $\bar{t}^{m}_{2007}$ and m_{2007}. Below, I first present what assumptions are made with respect to $\bar{t}$, thereafter I will show how the values of Δa, m_{2007} and $\bar{t}^{m}_{2007}$ are calculated.

1) Assumptions to $\bar{t}$

$\bar{t}$ is the (average) treatment intensity that is given to the outsiders. In this study, I will make two assumed values for $\bar{t}$, the first assumption is that the outsiders are given the (average) treatment intensity that is equal to 5 consultations *(i.e.* $\bar{t}$ *=5)* and second assumption is that is equal to 10 consultations *(i.e.* $\bar{t}$*=10)*. We will use these two values into the equation (14) separately to calculate value of *X based* on the given assumption.

The reason for choosing values for $\bar{t}$ which are 5 and 10 consultations is because that the outsiders we want to choose are the type of patients who are suffering from mild or moderate depression and/or anxiety. Our great interests to this group patient are due to following considerations: anxiety and depressive disorders are the two most-common types of mental suffering in Norway. However, due to the limitation of health care sources and capacity, patients with mild or moderate depression and/or anxiety are usually be rejected for treat by a specialist mental health care service, for example a District Psychiatric Center (DPC**)**. If they are left untreated, they pose a significant risk of future serious outcomes, such as attempted suicide, hospitalization, sick leave and work disability, this will cost society greatly (Mykletun & Knudsen 2009; OECD 2003). Fortunately, they can be treated successfully through various forms of psychotherapies and medications *(*Mykletun, Knudsen & Mathiesen 2009).

Therefore, giving them certain consultations (5 or 10 consultations) may help them go back to normal life and work, leading to cost reduction for society in totally.

2) Calculation of Δa

Δa is the number of admitted outsiders that follows from fulfilling the refusal rate target level (10%). This variable is defined as follows:

$$\Delta a = \left(\gamma_{2007} - \gamma_{object}\right) \times R_{2007} \qquad (15)$$

Where R_{2007} is the number of submitted referrals in 2007 *(see the concept explanation in the section3.2.2)* and it is derived from the DPC's data; γ_{object} means the target level of refusal rate for all DPCs , we assumed that this value is equal to 10% in the study *(γ_{object} =10%)*; γ_{2007} is the refusal rate in 2007, it is calculated by dividing the number of rejected referrals during 2007 *(r_{2007})* by the number of submitted referrals in 2007 *(R_{2007})*, and the calculation can be expressed as follows:

$$\gamma_{2007} = \frac{r_{2007}}{R_{2007}} \qquad (16)$$

By inserting (16) into equation (15), the number of admitted outsiders that follows from fulfilling the refusal rate target level (10%) can be expressed the following way:

$$\Delta a = \left(\frac{r_{2007}}{R_{2007}} - \gamma_{object}\right) \times R_{2007} \qquad (17)$$

When γ_{object} =10%, Δa can be written as

$$\Delta a = \left(\frac{r_{2007}}{R_{2007}} - 10\%\right) \times R_{2007} \qquad (18)$$

3) Calculations of m_{2007}

m_{2007} is the number of treated patients (insiders) that received more than 5 consultations in 2007. This variable is expressed as the number of treated patients (all the insiders) in 2007 *(N_{2007})* minus the number of insiders that received less than and equal to 5 consultations in 2007 *(y_{2007})*. It can be written as the following:

$$m_{2007} = N_{2007} - y_{2007} \qquad (19)$$

The variables N_{2007} *and* y_{2007} can be obtained from the actual data provided by the DPC.

4) Consultations of $\bar{t}^{m}_{2007}$

$\bar{t}^{m}_{2007}$ is the average treatment intensity (i.e. the average number of consultations) in 2007 for insiders that received more than 5 consultations, where *m* is the number of insiders that received more than 5 consultations. $\bar{t}^{m}_{2007}$ is calculated by dividing the total number of consultations in 2007 for all insiders that received more than 5 consultations *(M_{2007})* by the number of insiders that received more than 5 consultations *(m_{2007}).* It can be expressed as follows:

$$\bar{t}^{m}_{2007} = \frac{M_{2007}}{m_{2007}} \qquad (20)$$

In order to calculate $\bar{t}^{m}_{2007}$, we need to find sizes of M_{2007} and m_{2007}. We have known that m_{2007} is derived from the DPC's data *(see equation (19)).* M_{2007} is defined as the sum of consultations of each insider that received more than 5 consultations received during 2007 *($t_i^{2007} > 5\ consultations$).* It can be expressed as follows:

$$M_{2007} = \sum_{i=1}^{m} t_i^{2007} \qquad (t_i^{2007} > 5\ consultations) \qquad (21)$$

Where treatment intensity in 2007 *(t_i^{2007})* is defined as the number of consultations each insider receives, $t_i^{2007} > 5\ consultations$ refers to all insiders that received treatment intensity that is higher than 5 consultations in 2007, *i* refers to patient i.

By inserting (21) into equation (20), $\bar{t}^{m}_{2007}$ can be expressed the following way:

$$\bar{t}^{m}_{2007} = \frac{M_{2007}}{m_{2007}} = \frac{\sum_{i=1}^{m} t_i^{2007}}{m_{2007}} \qquad (t_i^{2007} > 5\ consultations) \qquad (22)$$

After we have explained four variables above, the calculation of *X* (the percent of consultations that is taken away from all insiders in 2007) can be expressed the following way by inserting (17) (19) (22) into (14):

$$X = \frac{\bar{t} \times \left(\frac{r_{2007}}{R_{2007}} - \gamma_{object} \right) \times R_{2007}}{\sum_{i=1}^{m} t_i^{2007}} \quad (t_i^{2007} > 5\ consultations) \qquad (23)$$

In addition, the (average) number of consultations that is taken from each insider that received more than 5 consultations in 2007, $\Delta\ \bar{t}_{2007}^{m}$, is the average treatment intensity in 2007 for insiders that received more than 5 consultations ($\bar{t}_{2007}^{m}$) multiply X, the calculation is expressed as follow:

$$\Delta\ \bar{t}_{2007}^{m} = \bar{t}_{2007}^{m} \times\ X \qquad (24)$$

6. RESULTS

The results following from the calculation method presented in chapter 5, for the five District Psychiatric Centers (DPCs), will now be presented. First, in table 3, many variables that describe the situation in 2007 for the five DPCs are presented.

Table 3. Descriptive statistics: Current situation (2007), policy objective and consequences -Five District Psychiatric Centers in Oslo, Norway in 2007.

Current situation (01.01 - 31.12,2007)	**DPC-A**	**DPC-B**	**DPC-C**	**DPC-D**	**DPC-E**
Total adult population (18 – 67 years old) in the district area *(P_{adults})*	25431	64216	82236	17035	30087
Number of submitted referrals in 2007 *(R_{2007})*	602	1437	1158	609	304
Referral rate *($\beta_{2007}=R_{2007}/P_{adults}$)*	2,4 %	2,2 %	1,4 %	3,6 %	1,0 %
Number of rejected referrals in 2007 *(r_{2007})*	99	422	257	118	50
Refusal rate in 2007 *($\gamma_{2007} = r_{2007}/R_{2007}$)*	16 %	29 %	22 %	19 %	16 %
Total admitted referrals in 2007 *(a_{2007})*	503	1015	901	491	254
Number of all treated patients (all insiders) in 2007 *(N_{2007})*	1067	1947	2091	770	292
Number of treated patients (insiders) that received less than or equal to 5 consultations *(y_{2007})*	524	1000	1200	302	117
Number of treated patients (insiders) that received more than 5 consultations *($m_{2007} = N_{2007} - y_{2007}$)*	543	947	891	468	175
The total number of consultations for all treated patients (all insiders) in 2007 (Maximum treatment capacity of the DPC) *($T_{2007} = \sum_{i=1}^{N} t_i^{2007}$)*	11602	23547	18524	7901	3144

The average treatment intensity (the number of average consultations) for all insiders in 2007 ($\bar{t}^{T}_{2007} = \frac{T_{2007}}{N_{2007}}$)		10,9	12,1	8,9	10,3	10,8
The total number of consultations for all treated patients (insiders) that received less than or equal to 5 consultations in 2007 ($Y_{2007} = \sum_{i=1}^{y} t_i^{2007}$)		1144	2301	2552	748	268
The total number of consultations of all treated patients (insiders) that received more than 5 consultations in 2007 ($M_{2007} = \sum_{i=1}^{m} t_i^{2007}$)		10458	21246	15972	7153	2876
The average treatment intensity for all insiders that received more than 5 consultations in 2007 ($\bar{t}^{m}_{2007} = M_{2007}/m_{2007}$)		19,3	22,4	17,9	15,3	16,4
Assumed values of the (average) treatment intensity that is given to the outsiders ($\bar{t}$)		10 5	10 5	10 5	10 5	10 5
Policy objective		**DPC-A**	**DPC-B**	**DPC-C**	**DPC-D**	**DPC-E**
Objective of refusal rate (γ_{object})		10 %	10 %	10 %	10 %	10 %
Policy consequences		**DPC-A**	**DPC-B**	**DPC-C**	**DPC-D**	**DPC-E**
Reduction in refusal rate ($\gamma_{2007} - \gamma_{object}$)		6 %	19 %	12 %	9 %	6 %
The number of admitted outsiders that follow from fulfilling the refusal rate target level (10%) $[\Delta a = (\gamma_{2007} - \gamma_{object}) \times R_{2007}]$		39	278	141	57	20
The percent of consultations that is taken away from all insiders that received more than 5 consultations in 2007 ($X = \frac{\bar{t} \times \Delta a}{\bar{t}^{m}_{2007} \times m_{2007}}$)	$\bar{t}$=10	3,71 %	13,1%	8,84 %	7,98 %	6,82 %
	$\bar{t}$=5	1,86 %	6,55 %	4,42 %	3,99 %	3,41 %

The (average) number of consultations that is taken away from each insider that received more than 5 consultations in 2007 ($\Delta\, \bar{t}^{m}_{2007} = \bar{t}^{m}_{2007} \times X$)	$\bar{t}$=*10*	0,71	2,94	1,58	1,22	1,12
	$\bar{t}$=5	0,36	1,47	0,79	0,61	0,56

In the table 3, the input data described under the heading "current situation" are obtained from the data collected from DPCs databases. The data includes numbers on total adult population (18 – 67 years old) in the catchment area, the number of submitted referrals, the number of rejected referrals, the number of treated patients (insiders) and their total consultations. Based on this data, we can calculate referral rates, refusal rates and average treatment intensity for all patients and patients with more than 5 consultations (insiders).

In addition, by introducing our two assumptions (a 10% refusal rate target level and average treatment intensities for outsiders equal to 5 or 10 consultations) and combining this with data on the current situation, we are able to estimate the policy consequences presented in table 3.

Furthermore, in order to calculate *X* (the percent of consultations that is taken away from all insiders that received more than 5 consultations in 2007) for each DPC, the following four variables are used: (1) assumed values of the (average) treatment intensity that is given to the outsiders *($\bar{t}$)*; (2) the number of admitted outsiders that follow from fulfilling the refusal rate target level (10%) *(Δa)*; (3) the average treatment intensity for all insiders that received more than 5 consultations in 2007 *($\bar{t}^{m}_{2007}$)*; (4) the number of treated patients (insiders) that received more than 5 consultations *(m_{2007})*. These are presented in table 3. By inserting the above four variables into equation (14) presented in chapter 5, the results of *X* for five DPCs are calculated. For example in the DPC-A, putting these four numbers ($\bar{t}$=5, Δa=39, $\bar{t}^{m}_{2007}$=19.3, m_{2007}=543) into (14), we get that *X* is equal to 1.86%, when $\bar{t}$=10, *X* is equal to 3.71%. In the next section I present the findings from our calculations.

6.1 Results of the reductions in the average treatment intensities needed to reach refusal rates at 10%

The DPCs in our study are required to meet the goal of a lower refusal rate equal to 10%. A new admissions are provided in average 5 consultations or 10 consultations. What reductions in treatment intensities are now needed to achieve this target. The results for the five DPCs are presented in table 4.

Table 4. Calculated values of reductions in treatment intensities to reach refusal rate at 10%.

DPC	The average treatment intensity (number of consultations) for all insiders that received more than 5 consultations in 2007 ($\bar{t}^{m}_{2007}$)	Reduction in refusal rate ($\gamma_{2007} - \gamma_{object}$)	The number of admitted outsiders that follow from fulfilling the refusal rate target level (10%) (Δa)	The (average) number *(The percent)* of consultations that is taken away from each insider *(all insiders)* that received more than 5 consultations in 2007 [$\Delta\, \bar{t}^{m}_{2007}\,(X)$]	
				$\bar{t}$ =5	$\bar{t}$ =10
DPC-A	19,3	6 %	39	0,36 *(1,86 %)*	0,71 *(3,71 %)*
DPC-B	22,4	19 %	278	1,47*(6,55 %)*	2,94 *(13,1 %)*
DPC-C	17,9	12 %	141	0,79 *(4,42 %)*	1,58 *(8,84 %)*
DPC-D	15,3	9 %	57	0,61 *(3,99 %)*	1,22 *(7,98 %)*
DPC-E	16,4	6 %	20	0,56 *(3,41 %)*	1,12 *(6,89 %)*

DPC-A

For DPC-A to reach the refusal rate target level at 10%, the refusal rate of 2007 had to be reduced by 6 percentage points, which again meant that 39 outsiders would be admitted in 2007. Since these 39 patients, in average, were given a treatment intensity equal to 5 consultations, we found that (1) the percent of consultations that is taken away from all insiders that received more than 5 consultations in 2007 became equal to 1.86, (2) the (average) number of consultations that is taken away from each insider that received

more than 5 consultations in 2007 became equal to 0.36 – implying a reduction in the average number of consultations from 19.3 to 18.94. If the same 39 patients (outsiders) were given a treatment intensity equal to10 consulations, the same two results became 3.71% and 0.71 (from 19.30 to 18.59).

DPC-B

For DPC-B to reach the refusal rate target level at 10%, the refusal rate of 2007 had to be reduced by 19 percentage points, which again meant that 278 outsiders would be admitted in 2007. Since these 278 patients, in average, were given a treatment intensity equal to 5 consultations, we find that (1) the percent of consultations that is taken away from all insiders that received more than 5 consultations in 2007 became equal to 6.55, (2) the (average) number of consultations that is taken away from each insider that received more than 5 consultations in 2007 became equal to 1.47 – implying a reduction in the average number of consultations from 22.4 to 20.93. If the same 278 patients (outsiders) were given a treatment intensity equal to 10 consulations, the same two results became 13.1% and 2.94 (from 22.4 to 19.46).

DPC-C

For DPC-A to reach the refusal rate target level at 10%, the refusal rate of 2007 had to be reduced by 12 percentage points, which again meant that 141 outsiders would be admitted in 2007. Since these 141 patients, in average, were given a treatment intensity equal to 5 consultations, we find that (1) the percent of consultations that is taken away from all insiders that received more than 5 consultations in 2007 became equal to 4.42, (2) the (average) number of consultations that is taken away from each insider that received more than 5 consultations in 2007 became equal to 0.79 – implying a reduction in the average number of consultations from 17.9 to 17.11. If the same 141 patients (outsiders) were given a treatment intensity equal to 10 consulations, the same two results became 8.84% and 1.58 (from 17.9 to 16.32).

DPC-D

For DPC-A to reach the refusal rate target level at 10%, the refusal rate of 2007 had to be reduced by 9 percentage points, which again meant that 57 outsiders would be admitted

in 2007. Since these 57 patients, in average, were given a treatment intensity equal to 5 consultations, we find that (1) the percent of consultations that is taken away from all insiders that received more than 5 consultations in 2007 became equal to 3.99, (2) the (average) number of consultations that is taken away from each insider that received more than 5 consultations in 2007 became equal to 0.61 – implying a reduction in the average number of consultations from 15.3 to 14.69. If the same 57 patients (outsiders) were given a treatment intensity equal to 10 consulations, the same two results became 7.98% and 1.22 (from 15.3 to 14.08).

DPC-E

For DPC-A to reach the refusal rate target level at 10%, the refusal rate of 2007 had to be reduced by 6 percentage points, which again meant that 20 outsiders would be admitted in 2007. Since these 20 patients, in average, were given a treatment intensity equal to 5 consultations, we find that (1) the percent of consultations that is taken away from all insiders that received more than 5 consultations in 2007 became equal to 3.41, (2) the (average) number of consultations that is taken away from each insider that received more than 5 consultations in 2007 became equal to 0.56 – implying a reduction in the average number of consultations from 16.4 to 15.84. If the same 20 patients (outsiders) were given a treatment intensity equal to 10 consulations, the same two results became 6.89% and 1.12 (from 16.4 to 15.28).

Not surprisngly, from table 4 we observe that the DPCs with the lowest relative reductions in refusal rates also have the lowest relative reductions in treatment-intensities (DPC-A and DPC-E). This follows because a relatively low reduction means relatively few outsiders, thus a lower transfer of consultations from insiders to outsiders are needed. Under the assumption that DPCs in average provide 10 consultations for outsiders, table 4 shows that both the percent and the (average) number of consultations that is taken away from all insiders that received more than 5 consultations are increased by double size in the overall DPCs. This follows because a higher treatment intensity means a higher resources demand, thus a higher transfer of consultations from insiders to outsiders are needed.

To sum up, our results show that there are differences across DPCs as concerning the reductions in average treatment intensities needed to recah the refusal rate target level. To reach a target level at 10%, the number of outsiders that are to be admitted varies between 39 patients and 278. Given an average treatment intensity for outsiders being equal to 5 consultations, the average treatment intensity for insiders (with more than 5 consulations) are to be reduced by from 1.86% to 6.55%. The DPCs must reduce in average from 0.36 to 1.47 consultations from their treated patients who have over 5 consultations to achieve this target. For 10 consultations, it is required that the average treatment intensities should be reduced by from the lowest 3.71% to the highest 13.1%, it is over 3 times size different. In another word, the DPCs must reduce in average from 0.71 to 2.94 consultations from their insiders that received more than 5 consultations to achieve the target of reusal rate at 10%.

6.2 Study limitations

There are several limitations to this study. First, there is the question as to whether our findings can be generalized to other DPC patient groups (e.g outpatient department serving adults with mental illness) and to other DPCs with different demographic characteristics, staff and resources. Clearly, our DPCs are not randomly selected and they are all located in Oslo, meaning that the selection of DPCs is biased.

Secondly, a thorough analysis has not been undertaken to investigate the real causes to high refusal rate and long waiting times in the DPCs. High refusal rates need not be the result of demand exceeding supply due to limited budgets. The problem of high refusal rates is a complex one with many potential causal factors for example various managerial or administrative shortcomings producing a low DPC productivity.

Furthermore, one challenge we faced in this study was a very limited research literature on reducing treatment intensity to improve patient access.

7. SUMMARY AND CONCLUSION

The current challenge facing most specialized mental health care services is one in which many individuals with psychiatric disorders remain untreated even when effective treatments exist. One major reason for this is a high prevalence of mental health disorders combined with limited budgets, thus demand for treatment exceeds supply. Excessive demand and scarce resources implies that, in order to improve patient access, decisions have to be made on how to allocate the limited resources.

In the study, a simple demand-supply model was developed to identify factors that may have an impact on the number of people waiting for treatment (*WT*). We identified 6 variables that play a role where 3 can be classified as demand-side factors (the admission rate, the referral rate and catchment area size) and 3 as supply-side factors (budget size, treatment intensity (average), and cost per consultation (treatment unit)).

Nevertheless, this study introduces the means of lowering (average) treatment intensity to improve patient access to the specialized mental health care services. The main idea is that a lower (average) treatment intensity (i.e. each patient receiving fewer consultations) means that available resources can be shared among more people in need of treatment. By reducing current refusal rates to the target refusal rate level at 10%, patient access will improve since more people now can be treated and thus waiting times will be reduced. A calculation method that transfer consultations from those that received treatment in 2007 (insiders) to those that did not receive treatment (outsiders), was undertaken to estimate what reductions in average treatment intensities are needed to achieve the target level. The calculation method was applied for outpatient clinics of five DPCs located in Oslo, Norway.

The results show that, to reach the refusal rate target level at 10%, the number of outsiders that would be admitted varied between 39 and 278 patients across the five DPCs . Given an average treatment intensity for outsiders being equal to 5 consultations, the average treatment intensities for insiders that received more than 5 consultations are to be reduced by 1.86% to 6.55% depending on the DPC. This equals a reduction from 0.36 to 1.47 consultations (average) for each insider that received more than 5 consultations. Given that outsiders in average receive 10 consultations, it follows that the

average treatment intensity for insiders (those receiving more than 5 consultations) must be, depending on the DPC considered, reduced by between 3.71% to the highest 13.1%. In other words, the DPCs must reduce the number of 0.71 to 2.94 consultations (average) for each insiders that received more than 5 consultations.

This study aims to investigate the consequences of changing the way current resources are distributed in order to increase patient access. Lowering treatment intensities have some positive consequences in that more people now can be treated and waiting times will be reduced. However, such benefits come at the expense of those already receiving treatment, since lower treatment intensities may imply lower health benefits from a treatment program. Under this situation, a decision-maker requires to make a comprehensive evaluation between the health gains (outsiders) and the health losses (insiders) across patients groups.

Our study demonstrates that lowering treatment intensities may improve access for people with mental disorders to specialized mental health care services. Such a redistribution of resources may increase the availability of treatments. Improving patients' access to care means enhancing their ability to secure appropriate and preferred medical assistance when and where it is needed. The potential policy of lowering treatment intensities may help bridge the gap in health care delivery. Our study suggests that patient access to specialized mental health care services can be improved without the need for extra resources.

8. REFERENCES

Council of Europe 2000, *Criteria for the management of waiting lists and waiting times in health care*, health and society report and recommendation, No. R (99) 21, Council of Europe, Strasbourg.

Dybendal K.E. & Skiri H. 2005, "Klare geografiske forskjeller i levealder mellom bydeler i Oslo", *Statistics Norway-Samfunnsspeilet*, No.6/2005, pp.18-28.

Furuholmen C. & Magnussen J. 2000, *Health Care Systems in Transition: Norway*, WHO Regional Office for Europe on behalf of the European Observatory on Health Systems and Policies, Copenhagen.

Johnsen J.R. 2006, *Health Care Systems in Transition: Norway*, WHO Regional Office for Europe on behalf of the European Observatory on Health Systems and Policies, Copenhagen.

Hauck K., Smith P.C. & Goddard M. 2004, *The economics of priority setting for health care: a literature review*, Health, Nutrition and Population (HNP) Discussion Paper, The International Bank for Reconstruction and Development / The World Bank, Washington, DC.

Helse Sør-Øst RHF 2005, *Regionalt strategiarbeid innen psykisk helsevern i Helse Øst - Høring*, Helse Sør-Øst RHF, Harmar.

Kessler R.C. et al. 2001, "The Effects of Chronic Medical Conditions on Work Loss and Work Cutback", *Journal of Occupational and Environmental Medicine*, No.43, pp.218-225.

Kjerstad E. & Kristiansen F. 2005, *Free choice, waiting time and length of stay in Norwegian hospitals*, Working paper 21/05, Institute For Research In Economics And Business Administration Bergen, Norway.

Knapp M. et al. 1997, "The cost consequences of changing the hospital-community balance: the mental health residential care study", *Psychological Medicine*, No.27, pp.681-692.

Knapp M. et al. 1998, "Home-based versus hospital-based care for serious mental illness: controlled cost-effectiveness study over four years", *British Journal of Psychiatry*, No.172, pp.506-512.

Leff J. et al. 1994, "The TAPS Project. 22: a five-year follow-up of long-stay psychiatric patients discharged to the community", *British Journal of Psychiatry*, (Suppl.), pp.13-17.

Lovdata 2004, *Pasientrettighetsloven: Kapittel 2. Rett til helsehjelp og transport- §1 Rett til nødvendig helsehjelp*, Lovdata, Oslo, [online] Accessible via http://www.lovdata.no/all/tl-19990702-063-002.html (last accessed: 20. 12.2009).

Marks I.M. et al. 1994, "Home-based versus hospital-based care for people with serious mental illness", *British Journal of Psychiatry*, No.165, pp.179-194.

Mykletun A. et al. 2007, "Anxiety, depression and cause-specific mortality", the HUNT Study, *Psychosomatic Medicine*, No. 69(4), pp.323-331.

Mykletun A., Knudsen A.K. & Mathiesen K.S. 2009, *Psykiske lidelser i Norge: Et folkehelseperspektiv*, Rapport 2009:8, Nasjonalt folkehelseinstitutt, Nydalen.

Mykletun A. et al. 2009, "Levels of anxiety and depression as predictors of mortality", the HUNT study, *British Journal of Psychiatry*, No.195, pp.118-125.

Mykletun A. & Knudsen A.K. 2009, *Tapte arbeidsår ved uførepensjonering for psykiske lidelser*, Rapport 2009:4, Nasjonalt folkehelseinstitutt, Nydalen.

National Health Plan for Norway (2007-2010) 2007, *Proposition to the Storting No.1 (2006-2007) Chapter 6.*

NAV (The Norwegian Labour and Welfare Administration) 2010, *Sykefraværsstatistikk: Sykefraværstilfeller 4 kv 2001-2009; Diagnose og kjønn; Antall*, NAV, [online] Accessible via http://www.nav.no/234022.cms (last accessed: 10. 11.2010).

NAV (The Norwegian Labour and Welfare Administration) 2010, *Raskere tilbake*, NAV, [online] Accessible via http://www.nav.no/Arbeid/Jobb+og+helse/Raskere+tilbake (last accessed: 22. 02.2010).

Norstrom T. 2006, "Per capita alcohol consumption and sickness absence", *Addiction*, 101(10), pp.1421-1427.

Norwegian Directorate of Health 2006, *Mental Health Services in Norway*, Norwegian Directorate of Health, Oslo, [online] Accessible via http://www.helsedirektoratet.no/portal/page?_pageid=134,67714&_dad=portal&_schema=PORTAL&navigation1_parentItemId=2016&navigation2_parentItemId=2016&navigation2_selectedItemId=4108&language=english&_piref134_67721_134_67714_67714.sectionId=&_piref134_67727_134_67714_67714.artSectionId=6469&_piref134_67727_134_67714_67714.articleId=52721 (last accessed: 10.12.2010).

Norwegian Directorate of Health 2008, *Prioriteringsveileder for spesialisthelsetjenesten - Generell del*, Norwegian Directorate of Health, Oslo.

Norwegian Directorate of Health 2010, *Fritt sykehusvalg Norge: Rettigheter*, Norwegian Directorate for Health, Oslo, [online] Accessible via http://www.frittsykehusvalg.no/Rettigheter/ (last accessed: 22. 02.2011).

OECD (Organization for Economic Co-Operation and Development) 2003, *Transforming disability into ability – Policies to promote work and income security for disabled people*, OECD Publications Service, Paris.

OECD (Organization for Economic Co-Operation and Development) 2008, *Mental health in OECD countries – policy brief*, OECD publications services, Paris.

Oslo kommune 2008, *Folkemengden i Oslo etter bydel og 1-årige aldersgrupper: I alt, kvinner og menn 2004-2010*, Oslostatistikken, Utviklings- og kompetanseetaten, Oslo, [online] Accessible via http://www.utviklings-og kompetanseetaten.oslo.kommune.no/oslostatistikken/befolkning/folkemengde/article160054-41861.htlm (last accessed: 22. 09.2010).

Riksrevisjonen 2008, *Riksrevisjonens undersøking av spesialisthelsetenesta sitt tilbod til vaksne med psykiske problem*, Dokument Nr.3:5 (2008-2009), Riksrevisjonen, Oslo.

Robert K. et al. 2004, "The treatment gap in mental health care", *Bulletin of the World Health Organization*, BWHO-82, pp.858-866.

Rognerud M., Strand B.H. & Dalgard O.S. 2002, "Psykisk helse i helse og levekårsundersøkelsen i 1998: Sosioøkonomiske forskjeller i psykisk helse og livsstil", *Norsk Epidemiologi*, No.12, pp.239-48.

Ruud T. et al. 2004, *Distrikspsykiatriske sentre i Norge i 2003*, SINTEF Helse, Oslo.

Skog O.J. 2001, "Alcohol consumption and overall accident mortality in 14 European countries", *Addiction* 96, pp.35-47.

Statens helsetilsyn 2001, *Håndbok i drift av psykiatriske poliklinikkers økt tilgjengelighet for brukerne, bedre styring av ressursene og mer fokus på resultatene*, Utredningsserien 2:2001, Statens helsetilsyn, Oslo.

Statens helsetilsyn 2009, *DPS: Landsdekkende tjenester, men varierende kvalitet? Oppsummering av første halvdel av Landsomfattende tilsyn 2008-09 med spesialisthelsetjenester ved distriktspsykiatriske sentre*, report 4/2009, Statens helsetilsyn, Oslo.

Statistics Norway 2006, *General Practitioners 2005 – Mental health problems are the most common diagnosis*, Statistics Norway, [online] Accessible via http://www.ssb.no/english/subjects/03/02/alegetj_en/ (last accessed: 12.11.2010).

Statistics Norway 2008, *Specialist health service 2007 – Accounts*, Statistics Norway, [online] Accessible via http://www.ssb.no/speshelse_en/arkiv/speshelseregn_en/art-2008-06-18-01-en.html (last accessed: 12.11.2010).

Statistics Norway 2009, *Helseregnskap1997-2008 – Jevn økning i helseutgiftene*, Statistics Norway, [online] Accessible via http://www.ssb.no/emner/09/01/helsesat/ (last accessed: 16.01.2011).

Statistics Norway 2010, *Spesialisthelsetjenesten 2009 – Spesialisthelsetjenesten i hundre: 2005-2009 Nøkkeltall*, Statistics Norway, [online] Accessible via http://www.ssb.no/emner/03/02/speshelse/ (last accessed: 12.11.2010).

The Ministry of Health and Care Services 2005, *Mental Health Services in Norway: Prevention - Treatment - Care*, The Ministry of Health and Care Services, Oslo.

Vissers M.H. et al. 2001, "Towards Decision Support for Waiting Lists: An Operations Management View", *Health Care Management Science*, No. 4, pp.133-142.

Wells K.B. et al. 1989, "The Functioning and Well-Being of Depressed Patients: Results from the Medical Outcomes Study", *Journal of the American Medical Association*, No.262 -7, pp. 914-919.

WHO (World Health Organization) 2005, *Mental health: facing the challenges, building solutions*, WHO European Ministerial Conference.

WHO (World Health Organization) 2010, *Health topics: Mental Disorders*, WHO, [online] Accessible via http://www.who.int/topics/mental_disorders/en/ (last accessed: 16.12.2010).